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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,265	06/26/2006	Taro Yamamoto	292993US26PCT	5656
22850 7590 03/19/2010 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER KOCH, GEORGE R				
ART UNIT		PAPER NUMBER		
1791				
NOTIFICATION DATE		DELIVERY MODE		
03/19/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/584,265

Applicant(s)

YAMAMOTO ET AL.

Examiner

George R. Koch III

Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 17-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 26-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/GS/US)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of group I, claims 1-16 and 26-31 in the reply filed on 11/19/2009 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-6, 8-9, 11-16 and 26-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsuyama (US 2001/0009452).

As to claim 1, Matsuyama discloses developing apparatus (Figure 10) comprising: a substrate holding unit (61) for holding a substrate in a substantially horizontal attitude, the substrate *capable of* having an exposed resist thereon; a developer supply nozzle (Figure 13 and 14, side 111) for delivering a developing solution to the substrate, the developer supply nozzle having therein an ejection port that has a length substantially equal to or larger than a width of an effective area of the substrate (see Figure 10; see also paragraph 0066 discussing similar embodiments and disclosing that the nozzle is longer than the diameter of the wafer; see also paragraph 99 disclosing the length is larger than the diameter of the wafer W); a diluent supply nozzle (Figure 13 and 14, side 112) for delivering a diluent to the substrate, the diluent supply nozzle having therein an ejection port that has a length substantially equal to or larger than the

width of the effective area of the substrate (see Figure 10) ; a temperature regulating unit (temperature control tube S) for controlling temperature of the developing solution to be supplied from the developer supply nozzle according to a type of the resist on the substrate or a specific geometrical characteristic of a pattern of the resist; a drive mechanism (paragraph 0068 disclosing a motor for driving the arm) for moving the developer supply nozzle and the diluent supply nozzle from one end of the substrate to the opposite end of the substrate; and a control unit (paragraph 0099 discloses a controlling unit 131). The control unit is capable of being used for controlling operation of the diluent supply nozzle such that the diluent is supplied to a surface of the substrate when the developing solution is deteriorated due to progression of developing reaction after supplying of the developing solution so that a developing reaction rate is lowered.

As to claim 2, Matsuyama discloses apparatus includes plural number of said developer supply nozzles, and each of the developer supply nozzles is provided with a temperature regulating unit to control the temperature of a developing solution.

As to claim 3, Matsuyama discloses the developer supply nozzles are integrated (see Figure 20 and 22) together into a single liquid-supplying nozzle unit moved by a common drive mechanism.

As to claim 4, Matsuyama discloses the developer supply nozzle and the diluent supply nozzle are integrated together (see Figure 10-15) into a single liquid-supplying nozzle unit moved by a common drive mechanism.

As to claim 5, Matsuyama discloses the liquid-supplying nozzle unit is adapted to eject a plurality of developing solutions or diluents through a common ejection port (see paragraph

0100, disclosing different concentrations of solutions, see also Figure 22, showing different sources 141c, 142c, 143c, and 114a and 114d).

As to claim 6, Matsuyama is capable of being used such that wherein: the liquid-supplying nozzle unit has a developer ejection port for ejecting a developing solution and a diluent ejection port for ejecting a diluent; and the developer ejection port and the diluent ejection port are arranged adjacent each other in a direction of movement of the liquid-supplying nozzle unit. Matsuyama shows the two ports adjacent each other as claimed. See Figures. See items 111 and 112.

As to claim 8, comprising means for selecting¹ one of a plurality of prepared developing solutions as a developing solution to be ejected through a developer supply (such as valves 141a, 142a, 143a, see figure 22, see paragraph 0100-105), wherein temperature of the selected developing solution is capable of being adjusted according to the type of the resist on the substrate or the specific geometrical characteristic of the pattern of the resist (via the temperature control tubes).

As to claim 9, Matsuyama is capable of being used such that while said one developing solution is selected, the temperature of another developing solution is adjusted.

As to claim 11, Matsuyama discloses a temperature regulating unit (S) is arranged in a developer supply nozzle to control the temperature of a developing solution.

As to claim 12, Matsuyama discloses that a temperature regulating unit (S) is arranged in the liquid-supplying nozzle.

As to claim 13, Matsuyama discloses a concentration control unit (such as pumps 141b, 142b, 143b and valves 141a, 142a, 143a) for controlling concentration of a developing solution to be supplied through a developer supply nozzle, according to the type of the resist on the substrate to be developed or the specific geometrical characteristic of the pattern of the resist. The valves are capable of being used to perform the function claimed.

As to claim 14, Matsuyama discloses means for selecting² (such as valves 141a, 142a, 143a, see figure 22, see paragraph 0100-105) one of a plurality of prepared developing solutions as a developing solution to be ejected through a developer nozzle, wherein the concentration of the selected developing solution is capable of being adjusted according to the type of the resist on the substrate or the specific geometrical characteristic of the pattern of the resist.

As to claim 15, matsuyama is capable of being used such that while said one developing solution is selected, concentration of another developing solution is adjusted.

As to claim 16, Matsuyama is capable of being used such that at any portion of an effective area of the substrate, a diluent is supplied 20 seconds or less after a developing solution is supplied. See MPEP 2114 and 2115.

As to claims 26-29, Matsuyama is capable of being used to achieve the claimed temperature ranges. See MPEP 2114 and 2115.

Claim Rejections - 35 USC § 103

¹ Means for selecting invokes 112 6th paragraph under MPEP 2181. The specification makes clear that the means for selecting can include valves.

² Means for selecting invokes 112 6th paragraph under MPEP 2181. The specification makes clear that the means for selecting can include valves.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claim 7 and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuyama.

As to claim 7, Matsuyama is capable of being used such that the developer ejection port is located on a forward side of the liquid-supplying nozzle unit with respect to the direction of movement of the liquid-supplying nozzle unit.

Matsuyama does not disclose a suction port is provided between the developer ejection port and the diluent ejection port to suck a developing solution on the surface of the substrate. However, official notice is taken that suction ports are well known and conventional in solution discharge. Such suction ports prevent overdischarge of the developer. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such a suction port in order to prevent overdischarge.

As to claim 10, Matsuyama is silent as to the the control unit is configured to: store data showing relationship between types of resists on the substrate to be developed or specific

geometrical characteristics of patterns of the resists and developing solution temperatures suitable therefor; and control, based on the data, the temperature regulating unit to adjust the temperature of a developing solution to a value suitable for a resist to be developed.

However, official notice is taken that such control is well known and conventional. Such controls would ensure proper dispense temperature. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such a control unit to achieve proper temperature.

7. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuyama as applied to claim 1, and further in view of Takekuma (US 6,284,043)

Matsuyama does not disclose a damper rod is arranged in an ejection port of the developer supply nozzle or an ejection port of the diluent supply nozzle such that the developing solution or the diluent collides with the damper rod before being ejected; and the damper rod is configured to change the temperature thereof, whereby the temperature of the developing solution or the diluent can be adjusted by means of the damper rod.

However, Takekuma discloses a damper rod (collision bar 62) is arranged outside an ejection port of the developer supply nozzle or an ejection port of the diluent supply nozzle such that the developing solution or the diluent collides with the damper rod before being ejected. Takekuma discloses that the damper rod reduces the amount of air and microbubbles in the solution, and reduces discharge speed, which prevents damage to the substrate. The damper rod *is capable of being* to change the temperature thereof (simply by being a different temperature

than the discharge solution), whereby the temperature of the developing solution or the diluent can be adjusted by means of the damper rod.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such a damper bar to prevent damage to the substrate.

8. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuyama as applied to claim 4.

As to claim 31, Matsuyama discloses that the liquid-supplying nozzle unit is provided therein with a developer buffer portion for storing a developing solution therein and a diluent buffer portion for storing a diluent therein,

Matsuyama does not disclose that the temperature adjusting device utilizing Peltier effect is arranged between the developer buffer portion and the diluent buffer portion.

However, official notice is taken that peltier devices are well-known and conventional. Such devices provide accurate temperature control. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such a peltier device in order to achieve accurate temperature control.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (571) 272-1230 (TDD only). If the applicant cannot make a direct TDD-to-TDD call, the applicant can communicate by calling the Federal Relay Service at 1-866-377-8642 and giving the operator the

above TDD number. The examiner can also be reached by E-mail at george.koch@uspto.gov in accordance with MPEP 502.03. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip Tucker can be reached on (571) 272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George R. Koch III/
Primary Examiner, Art Unit 1791

3/15/2010